UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,750	10/03/2003	Kyoung-hwan Park	1293.1950	6605

21171 7590 06/12/2007

STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER	
BIBBINS, LATANYA	
ART UNIT	**PAPER NUMBER**
2627	
MAIL DATE	**DELIVERY MODE**
06/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/678,750	**Applicant(s)** PARK ET AL.
	Examiner LaTanya Bibbins	**Art Unit** 2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *21 March 2007*.
2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-23* is/are rejected.
7)☒ Claim(s) *7 and 20* is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *03 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☒ All b)☐ Some * c)☐ None of:
    1.☒ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In the remarks filed on March 21, 2007, Applicant amended claims 1, 4, 7, 10, 11, 14, 17, 20, and 23 and submitted arguments for allowability of pending claims 1-23.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 4, 7, 10, 11, 14, 17, 20, and 23 have been considered but are moot in view of the new grounds of rejection.

Claim Objections

3. Claims 7 and 20 are objected to because of the following informalities:

Claims 7 and 20 recite "a high-pass filter which removes AC components ***form*** the SPP signal." Replacing "form" with "from" is suggested.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. ***Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deguchi et al. (US Patent Number 4,787,076).***

Regarding claim1, Deguchi discloses a tracking error signal generating apparatus comprising:

a main beam push pull (MPP) signal generating unit which generates an MPP signal according to electrical signals output by main photodetecting units based on a calculated deviation of beam powers detected by the main photodetecting units arranged on right and left sides of a specific track, respectively (*main beam tracking error signal,* Col. 4, Lines 19-25; Col. 5, Lines 24-25; see Figures 2 and 6-7);

a side beam push pull (SPP) signal generating unit which generates an SPP signal according to electrical signals output by photodetecting units based on a calculated deviation of beam powers detected by the photodetecting units, the photdetecting units being one of pairs of the main photodetecting units diagonally arranged with respect to the track and side photodetecting units disposed on opposing sides of the track and outside of the main photdetecting units (*tracking error signals resulting from auxiliary beams,* Col. 4, Lines 28-32; see photodetector arrangement in Fig 6-7); and

a subtractor which generates a tracking error signal by calculating a difference between the MPP signal and the filtered SPP signal (*performing addition or subtraction of the* TE_1 *(auxiliary beams tracking error) and* TE_0 *(main beam tracking error signal) signals based on phase difference,* Col. 6, Lines 48-58).

While Deguchi does not specifically disclose a high-pass filter which removes AC components from the SPP signal, Deguchi does however disclose a low-pass filter which removes AC components from the SPP signal (Col. 4, Lines 49-51).

Examiner takes official notice that providing a low-pass filter in series with a signal output results in the equivalent frequency response as connecting a high-pass filter to ground at the signal output (i.e. removing AC components from a signal and allowing DC components to pass). Therefore, it would have been an obvious matter of design choice to provide a high-pass filter to ground versus having a low-pass filter in series with the SPP signal since the applicant has not disclosed that a high-pass filter solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a low-pass filter in series.

Regarding claim 2, Deguchi discloses the apparatus of claim 1, wherein the MPP signal generating unit generates the MPP signal by performing an operation on electrical signals a, b, c, and d which satisfies an equation MPP=(a+d)-(b+c) and the SPP signal generating unit generates the SPP signal by performing an operation on the electrical signals a, b, c, and d which satisfies an equation SPP=(a+c)-(b+d), wherein the main photodetecting units comprise main photodetecting units PD_A, PD_B, PD_C, and PD_D which respectively output the electrical signals a, b, c, and d, wherein the main photodetecting units PD_A, PD_B, PD_C, and PD_D are positioned at four quadrants in a clockwise direction, and wherein the main photodetecting units PD_A and PD_D are symmetrically arranged with the main photodetecting units PD_B and PD_C with respect to the track (Col. 4, Lines 18-33; see Figs. 2 and 6).

Regarding claim 3, Deguchi discloses the apparatus of claim 1, wherein the MPP signal generating unit generates an MPP signal by performing an operation on electrical signals a, b, c, and d which satisfies an equation MPP=(a+d)-(b+c) and the

SPP signal generating unit generates an SPP signal by performing an operation on electrical signals e and f which satisfies an equation SPP=(e-f), wherein the main photodetecting units comprise main photodetecting units PD_A, PD_B, PD_C, and PD_D which respectively output the electrical signals a, b, c, and d, wherein the main phtodetecting units PD_A, PD_B, PD_C, and PD_D are positioned at four quadrants in a clockwise direction, wherein the main photodetecting units PD_A and PD_D are symmetrically arranged with the main photodetecting units PD_B and PD_C with respect to the track, wherein the side photodetectors comprise side photodetecting units PD_E and PD_F which respectively output electrical signals e and f, and wherein the side photodetecting units PD_E and PD_F are symmetrically arranged at opposing sides of the track and outside of the main photodetecting units PD_A, PD_B, PD_C, and PD_D (Col. 4, Lines 18-33; see Figs. 2 and 6).

Regarding claim 4, Deguchi discloses a method of generating a tracking error signal comprising:

wherein the MPP signal is obtained by calculating a deviation of beam powers detected by main photodetecting units which are arranged in right and left directions with respect to a track and the SPP signal is obtained by calculating a deviation of beam powers detected by photodetecting units which are one of pairs of the main photodetectors diagonally arranged with respect to the track and side photodecting units disposed on opposing sides of the track and outside of the main photodetecting units (Col. 4, Lines 18-33; see Figs. 2 and 6); and calculating a difference between an MPP signal and an SPP signal whose AC components are removed (low-pass filter, Col. 4, Lines 49-51),

While Deguchi does not specifically disclose a high-pass filter which removes AC components from the SPP signal, Deguchi does however disclose a low-pass filter which removes AC components from the SPP signal (Col. 4, Lines 49-51).

Examiner takes official notice that providing a low-pass filter in series with a signal output results in the equivalent frequency response as connecting a high-pass filter to ground at the signal output (i.e. removing AC components from a signal and allowing DC components to pass). Therefore, it would have been an obvious matter of design choice to provide a high-pass filter to ground versus having a low-pass filter in series with the SPP signal since the applicant has not disclosed that a high-pass filter solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a low-pass filter in series.

Regarding claims 5 and 6, these claims contain limitation similar to those in claims 2 and 3 respectively, and are rejected for the same reasons of obviousness used above.

Regarding claim 7, Deguchi discloses an optical recording/reproducing system, comprising:

a pickup which emits a laser beam toward an optical medium and detects a reflected laser beam reflected from a disc (Col. 3 Lines 15-68);

a tracking error signal generating unit that generates a tracking error signal by calculating a difference between an MPP signal obtained by calculating a deviation of beam powers detected by main photodetecting units which are arranged in right and left directions with respect to a track and an SPP signal obtained by calculating a deviation of beam powers detected by photodetecting units which are one of main photodetecting units diagonally arranged with respect to the track and signals output by side photodetecting units disposed on opposing sides of the main photodetectors (*main beam tracking error signal,* Col. 4, Lines 19-25; Col. 5, Lines 24-25; *tracking error signals resulting from auxiliary beams,* Col. 4, Lines 28-32; *performing addition or subtraction of the* TE_1 *(auxiliary beams tracking error) and* TE_0 *(main beam tracking error signal) signals based on phase difference,* Col. 6, Lines 48-58; and Figures 2, 6, and 7);

a servo controller which generates a tracking driving signal which is used to move an optical system of the pickup in a radial direction so as to direct the laser beam at a center of the track, using the tracking error signal (Col. 5, Lines 64-68); and

a tracking servo driving unit which drives a tracking actuator included in the pickup in response to the tracking driving signal (Col. 4, Lines 38-44); and

While Deguchi does not specifically disclose a high-pass filter which removes AC components from the SPP signal, Deguchi does however disclose a low-pass filter which removes AC components from the SPP signal (Col. 4, Lines 49-51).

Examiner takes official notice that providing a low-pass filter in series with a signal output results in the equivalent frequency response as connecting a high-pass filter to ground at the signal output (i.e. removing AC components from a signal and allowing DC components to pass). Therefore, it would have been an obvious matter of design choice to provide a high-pass filter to ground versus having a low-pass filter in series with the SPP signal since the applicant has not disclosed that a high-pass filter solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a low-pass filter in series.

Regarding claims 8 and 9, these claims contain limitation similar to those in claims 2 and 3 respectively, and are rejected for the same reasons of obviousness used above.

Claim 10 is drawn to the computer readable medium corresponding to the method of using same as claimed in claim 4. Therefore computer readable medium claim 10 corresponds to method claim 4, and is rejected for the same reason of obviousness as used above.

Regarding claim 11, Deguchi discloses a tracking error signal generator comprising:

a main push pull (MPP) signal generator which generates an MPP signal based on a difference between a first sum signal representing the sum of signals output from main photodetecting portions disposed on a side of a track and a second sum signal representing the sum of signals output by the main photodetecting portions disposed on an opposing side of the track (*main beam tracking error signal,* Col. 4, Lines 19-25; Col. 5, Lines 24-25; see Figures 2 and 6-7);

a side push pull (SPP) signal generator which generates an SPP signal based on a difference between one of a third sum signal representing the sum of signals output from the main photodetecting portions which are diagonally disposed with respect to the track in a first direction and a fourth sum signal representing the sum of signals output by the main photodetecting portions diagonally disposed with respect to the track in a second direction normal to the first and a fifth signal output by a first side photodetector and a sixth signal output by a second side photodetector (*tracking error signals resulting from auxiliary beams,* Col. 4, Lines 28-32; see photodetector arrangement in Fig 6-7); and

a subtractor which generates a tracking error signal based on a difference between the MPP signal and a filtered SPP signal (*performing addition or subtraction of the* TE_1 *(auxiliary beams tracking error) and* TE_0 *(main beam tracking error signal) signals based on phase difference,* Col. 6, Lines 48-58).

While Deguchi does not specifically disclose a high-pass filter which removes AC components from the SPP signal, Deguchi does however disclose a low-pass filter which removes AC components from the SPP signal (Col. 4, Lines 49-51).

Examiner takes official notice that providing a low-pass filter in series with a signal output results in the equivalent frequency response as connecting a high-pass filter to ground at the signal output (i.e. removing AC components from a signal and allowing DC components to pass). Therefore, it would have been an obvious matter of design choice to provide a high-pass filter to ground versus having a low-pass filter in series with the SPP signal since the applicant has not disclosed that a high-pass filter solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a low-pass filter in series.

Regarding claim 12, Deguchi discloses the tracking error signal generator of claim 11, wherein the main photodetecting portions are positioned at four quadrants of a photodetector in a clockwise direction and the main photodetecting portions on the first side of the track are symmetrically arranged with the main photodetecting portions on the opposing side of the track (see the photodetector arrangement in Figures 2 and 6).

Regarding claim 13, Deguchi discloses the tracking error signal generator of claim 11, wherein the side photodectors are disposed at opposing sides of the track and outside of the main photodetectors (see the photodetector arrangement in Figures 2 and 6).

Regarding claim 14, Deguchi discloses a method of generating a tracking error signal, comprising:

generating a main push pull (MPP) signal based on a difference between a first sum signal representing the sum of signals output from main photodetecting portions disposed on a side of a track and a second sum signal representing the sum of signals output by the main photodetecting portions disposed on an opposing side of the track (*main beam tracking error signal,* Col. 4, Lines 19-25; Col. 5, Lines 24-25; see Figures 2 and 6-7);

generating a side push pull (SPP) signal based on a difference between one of a third sum signal representing the sum of signals output from the main photodetecting portions which are diagonally disposed with respect to the track in a first direction and a fourth sum signal representing the sum of signals output by the main photodetecting portions diagonally disposed with respect to the track in a second direction normal to the first and a firth sum signal output by a first side photodetector and a sixth sum signal output by a second side photodetector (*tracking error signals resulting from auxiliary beams,* Col. 4, Lines 28-32; see photodetector arrangement in Fig 6-7); and

generating a tracking error signal based on a difference between the MPP signal and a filtered SPP signal (*performing addition or subtraction of the* TE_1 *(auxiliary beams tracking error) and* TE_0 *(main beam tracking error signal) signals based on phase difference,* Col. 6, Lines 48-58).

While Deguchi does not specifically disclose a high-pass filter which removes AC components from the SPP signal, Deguchi does however disclose a low-pass filter which removes AC components from the SPP signal (Col. 4, Lines 49-51).

Examiner takes official notice that providing a low-pass filter in series with a signal output results in the equivalent frequency response as connecting a high-pass filter to ground at the signal output (i.e. removing AC components from a signal and allowing DC components to pass). Therefore, it would have been an obvious matter of design choice to provide a high-pass filter to ground versus having a low-pass filter in series with the SPP signal since the applicant has not disclosed that a high-pass filter solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a low-pass filter in series.

Regarding claims 15 and 16, these claims contain limitation similar to those in claims 12 and 13 respectively, and are rejected for the same reasons of obviousness used above.

Claims 17, 18, and 19 are drawn to the computer readable medium corresponding to the method of using same as claimed in claims 14, 15, and 16 respectively. Therefore computer readable medium claims 17, 18, and 19 correspond to method claims 14, 15 and 16, and are rejected for the same reason of obviousness as used above.

Regarding claim 20, Deguchi discloses an optical recording/reproducing system, comprising:

a pickup having a light beam generator which generates a light beam, an optical system which focuses the light beam onto an optical medium, a focus/tracking actuator which moves the optical system in a radial direction with respect to the optical medium in response to a tracking driving signal so as to direct the light beam at a specific track on the optical medium, and a photodetector section including main photodetecting portions which receive the light beam after the light beam is reflected from the optical medium and output respective signals in response thereto (Col. 3 Lines 15-68; Col. 4, Lines 34-44);

a tracking error signal generator which generates a tracking error signal representing a difference between a main push pull (MPP) signal and a side push pull (SPP) generator (*performing addition or subtraction of the* TE_1 *(auxiliary beams tracking error) and* TE_0 *(main beam tracking error signal) signals based on phase difference,* Col. 6, Lines 48-58; and Figures 2, 6, and 7);

a servo controller which generates the tracking driving signal based on the tracking error signal (Col. 4, Lines 38-44), wherein the MPP signal is generated based on a difference between a first sum signal representing the sum of signals output from the main photodetecting portions disposed on a side of a track and a second sum signal representing the sum of signals output by the main photodetecting portions disposed on an opposing side of the track (*main beam tracking error signal,* Col. 4, Lines 19-25; Col. 5, Lines 24-25; *tracking error signals resulting from auxiliary beams,* Col. 4, Lines 28-32; *performing addition or subtraction of the TE_1 (auxiliary beams tracking error) and TE_0 (main beam tracking error signal) signals based on phase difference,* Col. 6, Lines 48-58; and Figures 2, 6, and 7), and

wherein the SPP signal is generated based on a difference between one of a third sum signal representing the sum of signals output from the main photodetecting portions which are diagonally disposed with respect to the track in a first direction and a fourth sum signal representing the sum of signals output by the main photodetecting portions diagonally disposed with respect to the track in a second direction normal to the first and a fifth signal output by a first side photodetector and a sixth signal output by a second side photodetector (*tracking error signals resulting from auxiliary beams,* Col. 4, Lines 28-32; see photodetector arrangement in Fig 6-7; ; *performing addition or subtraction of the TE_1 (auxiliary beams tracking error) and TE_0 (main beam tracking error signal*).

While Deguchi does not specifically disclose a high-pass filter which removes AC components from the SPP signal, Deguchi does however disclose a low-pass filter which removes AC components from the SPP signal (Col. 4, Lines 49-51).

Examiner takes official notice that providing a low-pass filter in series with a signal output results in the equivalent frequency response as connecting a high-pass filter to ground at the signal output (i.e. removing AC components from a signal and allowing DC components to pass). Therefore, it would have been an obvious matter of design choice to provide a high-pass filter to ground versus having a low-pass filter in series with the SPP signal since the applicant has not disclosed that a high-pass filter solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a low-pass filter in series.

Regarding claims 21 and 22, these claims contain limitation similar to those in claims 12 and 13 respectively, and are rejected for the same reasons of obviousness used above.

Regarding claim 23, Deguchi discloses a filter in a tracking error signal generating circuit which generates a tracking error signal using a differential push pull method, comprising:

wherein the SPP signal is obtained by using electrical signals output by photodetecting units based on a calculated deviation of beam powers detected by the photodetecting units, the photodetecting units being one of pairs of the main photodetecting units diagonally arranged with respect to the track and side photodetecting units disposed on opposing sides of the track and outside of the main photdetecting units (*tracking error signals resulting from auxiliary beams,* Col. 4, Lines 28-32; see photodetector arrangement in Fig 6-7), and wherein the tracking error signal can be stably generated regardless of a disc track pitch (Col. 2, Lines 25-34).

While Deguchi does not specifically disclose a high-pass filter which removes AC components from the SPP signal, Deguchi does however disclose a low-pass filter which removes AC components from the SPP signal (Col. 4, Lines 49-51). Examiner takes official notice that providing a low-pass filter in series with a signal output results in the equivalent frequency response as connecting a high-pass filter to ground at the signal output (i.e. removing AC components from a signal and allowing DC components to pass). Therefore, it would have been an obvious matter of design choice to provide a high-pass filter to ground versus having a low-pass filter in series with the SPP signal since the applicant has not disclosed that a high-pass filter solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a low-pass filter in series.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaTanya Bibbins whose telephone number is (571) 270-1125. The examiner can normally be reached on Monday through Friday 7:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LaTanya Bibbins

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER